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Cornell Cooperative Extension

Southwest NY Dairy, Livestock and Field Crops Program

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A partnership between Cornell University and the CCE Associations of
Allegany, Cattaraugus, Chautauqua, Erie and Steuben Counties.



**CROPS
COWS &
CRITTERS**
newsletter

Crops, Cows & Critters
Newsletter
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Fall Lime Application: Is It Too Late?

By Katelyn Miller; Field Crop and Forage Specialist

In parts of the region, rain seems to be remaining in the forecast, making crop harvest a challenge and leaving little time for other field activities. There is still a chance, however, to manage soil pH and be prepared for the 2023 growing season.

Why apply lime in the fall?

A large benefit of applying lime in the fall is time. When spring rolls around, farmers are busy catching up. Between working fields, planting crops, harvesting 1st cutting, etcetera, time becomes scarce. When wet springs occur, getting everything done becomes even more of a challenge. Applying lime during a wet season can increase risk of compaction, increasing the chances of more passes being necessary with tillage implements. With highly erodible fields, be cautious of timing in relation to precipitation to ensure you're getting the most out of your lime. Another benefit to applying lime in the fall is increased reaction time in the soil. A good rule of thumb is to apply lime 6 months before the desired pH for your crop is needed, therefore, applying lime in the fall creates ample time for your desired pH to occur.

Why is lime important?

Lime increases the pH of the soil, making it an important part of crop management. The pH level in your soil has an impact on nutrient availability in plants (see Figure 1), nitrogen fixation in legumes, plant health and root growth. Crops have different required pH levels (see Table 1) making proper management essential to a strong crop. Inadequate pH will create a weaker crop because of poor growth, in turn reducing water intake, and will make nutrients less available to the plant, creating possible deficiencies. To help avoid these problems, it is recommended to soil test approximately every three years to ensure that pH levels are appropriate for the crop you are growing.

How does your tillage system impact lime results?

In a conventional tillage system, lime will get incorporated into the soil causing it to react faster. This is not the case with no-till, where pH needs to be closely monitored for changes because lime is only being applied to the surface. Due to this, there can also be pH differences among soil layers making close management key to a successful liming program. ▀

Additional resources are available here:

Soil pH for Field Crops: Cornell University Nutrient Management Spear Program
http://nmsp.cals.cornell.edu/NYOnFarmResearchPartnership/curriculum/Lime/Lime_TutorialWorkbook.pdf

Timing of Lime Application for Field Crops: Cornell University Nutrient Management Spear Program
<http://nmsp.cals.cornell.edu/publications/factsheets/factsheet54.pdf>

Winter Limestone Application: Penn State Extension
<https://extension.psu.edu/winter-limestone-application>

To obtain hardcopy version of any of these resources, please connect with Katelyn Miller.

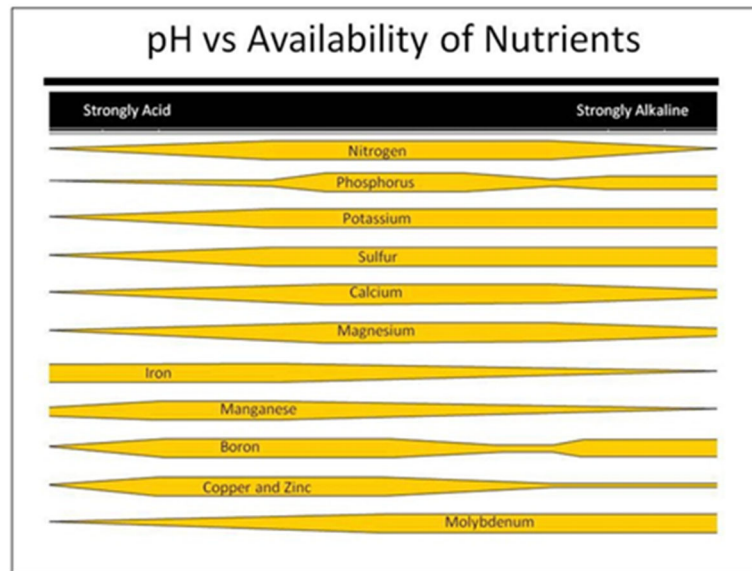


Figure 1: Availability of plant nutrients as soil pH changes.

Table 1: Ranges and recommended soil pH for optimal growth of various field crops in New York.

Crop Species	Normal growth pH range	Recommended pH range
Alfalfa	6.5 to 7.5	6.6 to 7.0
Barley	6.3 to 7.0	6.3 to 6.5
Birdsfoot trefoil	6.0 to 7.0	6.3 to 6.5
Clovers	5.8 to 7.0	5.8 to 6.2
Corn	5.8 to 7.0	5.8 to 6.2
Grasses	5.8 to 7.0	5.8 to 6.2
Oats	5.8 to 7.0	5.8 to 6.2
Soybeans	6.5 to 7.5	6.6 to 7.0
Wheat	6.3 to 7.0	6.3 to 6.5

Certain nutrients are not available at specific pH levels. So, you could be wasting valuable fertilizer and manure! It's important to soil test and apply lime accurately.



For more information about monitoring field pH, developing a nutrient management plan, or soil sampling for lime application - Call 716-640-2047.

Corn: How Does a Late-Season Frost Affect Crops?

By Peter Thomison; Ohio State University Extension Specialist

The following is information on the effects of late-season frost injury to corn from an article by Dr. Joe Lauer, Corn Extension Specialist at the University of Wisconsin.

Freezing temperatures before physiological maturity will damage corn. Maturity in corn occurs when kernels form a black layer at the kernel tip, grain will be at approximately 30 to 35 percent moisture. After maturity, no additional dry matter will be accumulated in the seed. In addition to creating quality problems, premature frost will reduce the yield of dry grain.

Temperatures required to kill corn plants

Corn is killed when temperatures are near 32 F for a few hours, and when temperatures are near 28 F for a few minutes. A damaging frost can occur when temperatures are slightly above 32 F and conditions are optimum for rapid heat loss from the leaves to the atmosphere, i.e. clear skies, low humidity, no wind.

At temperatures between 32 to 40 F, damage may be quite variable and strongly influenced by small variations in slope or terrain that affect air drainage and thermal radiation, creating small frost pockets. Field edges, low lying areas, and the top leaves on the plant are at greatest risk. Greener corn has more frost resistance than yellowing corn.

Symptoms of frost damage will start to show up about 1 to 2 days after a frost. Frost symptoms are water soaked leaves that eventually turn brown. Because it is difficult to distinguish living from dead tissue immediately after a frost event, the assessment should be delayed 5 to 7 days.

Grain quality impact

Late season frost damage can affect grain quality and is directly proportional to the stage of maturity and leaf tissue killed. Severe impacts on grain quality can occur at mid-dough, while moderate impacts are seen at the dent stage.

By the time the kernel has reached half milk line, only minor impacts will occur to grain quality. Differences among hybrids, overall plant vigor at the time of frost and subsequent temperatures will all affect final grain quality.

Other considerations

Growers should monitor stalk rot of severely defoliated plants, which have a good-sized ear. Photosynthate will be mobilized towards the ear rather than the stalk. This could weaken the stalk and encourage stalk rot development. These fields may need to be harvested early to avoid standability problems.

Yield impact on frost-damaged corn grain

Yield losses are negligible if frost occurs when grain moisture is below 35 percent. Yield loss is directly proportional to the stage of maturity and the amount of leaf tissue killed.

Knowing how to recognize frost damage and assess probable loss is important for decision making. An abbreviated version of the loss chart is shown in Table 7. For example, corn that was defoliated 20% at the milk stage would have 3% yield loss.

The stem on a corn plant is a temporary storage organ for material that eventually moves into the kernels. Grain yield will continue to increase about 7 to 20% after a light frost that only kills the leaves as long as the stem is not killed (Table 4).

Table 4. Potential grain yield losses after frost.

Corn development Stage	Killing frost (Leaves and stalk)	Light frost (Leaves only)
	percent yield loss	
R4 (Soft dough)	55	35
R5 (Dent)	40	25
R5.5 (50% kernel milk)	12	5
R6 (Black layer)	0	0

derived from Afuakwa and Crookston (1984)

Table 7. Estimated percent corn yield loss due to defoliation occurring at various stages of growth.

Stage of growth	Percent leaf area destroyed				
	20	40	60	80	100
	Yield loss (%)				
Tassel	7	21	42	68	100
Silked	7	20	39	65	97
Blister	5	16	30	50	73
Milk	3	12	24	41	59
Dough	2	8	17	29	41
Dent	0	4	10	17	23
Black layer	0	0	0	0	0

derived from Vorst (1990)

Frost damaged grain drying rates

Freezing air temperatures sometimes occur in early autumn before grain is physiologically mature ("black layer). Grain drying rates can range from 0.83 to 1.16% moisture

Temperatures near 32 F for a few hours and as low as 28 F for a few minutes can kill corn, but there are many factors including slope, hill cover, and variety.



Late season frost damage can affect grain quality and is directly proportional to the stage of maturity and leaf tissue killed.

less/day. Drying rates of grain following leaf blade defoliation or moderate to severe cold treatments are not different from the drying rate of normally maturing maize grain.

Husk condition does not affect grain drying rates. Defoliation and freezing before physiological maturity (R6) causes grain moisture levels to be 2 to 6 percentage points greater than that of grain from control plants when grain from control plants was in the 22 to 30% harvest range. Grain frozen before R6 required 4 to 9 additional days of field drying to reach the 22 to 30% moisture range.

Defoliation and cold treatments have little effect on the drying rates of cobs and ears, but moisture levels are greater than those of the control. Loose husks cause faster cob and ear drying compared to normal husks.

Characteristics of frost-damaged corn grain

- Small, misshapen, soft kernels
- Undeveloped starch structure; pithy kernels
- Test weights progressively below 52 lb./bu., depending on maturity (in 1993, some corn was less than 40 lb./bu.)
- Average protein (7.5 to 8.0 percent) in corn heavier than 45 lb./bu., lower protein in corn lighter than 45 lb./bu.
- High breakage susceptibility; many fines generated in handling
- Lower digestibility compared with normal corn, especially for test weights below 45 lb./bu.
- Little or no increase in test weight after drying
- Variable amino acid levels
- Moisture meters generally read low in immature corn. Surface drying of kernels, giving deceptively low (by 1 to 2 percent) moisture readings on dried corn

Recognize that these effects are progressive, with least impact on corn closer to maturity.

Uses for frost-damaged corn

Animal feed is the best use for frost-damaged corn. Low test weight corn used for large animal feed is only slightly less valuable (2 to 5 percent) than normal corn on a per-pound basis. Poultry, however, with limited volumetric capacity, may be more sensitive to frost-damaged corn than larger livestock.

Before feeding, test light corn for protein level, amino acid level, and mycotoxins (especially fumonisin and vomitoxin). Composition will vary. Be aware that fungi invade stressed corn more readily than they do normal corn.

Wet, dry milling, and dry grind ethanol operations will not want frost-damaged corn. Using frost-

damaged corn in wet milling causes low starch yields, and the separation of starch and protein cannot be clean. In dry milling, frost damaged corn sharply reduces yields of dry mill grits.

Processors will discount light corn more heavily than its reduction in feed value. Fermentation will be more variable in ethanol production, with lower yields and less predictable distillers grain quality.

Handling and storage of frost damaged grain

Immature and frost-damaged corn will have marginal quality, so it's important to manage equipment carefully to minimize further quality degradation. Set combines carefully, to balance the need to get small kernels with kernel damage. Manage the fines and chaff, which can increase mold problems in storage.

Dry grain to uniform moisture levels, a tricky business because harvest moisture is likely to be somewhat uneven after a cold, short growing season. Dry frost-damaged corn at reduced air temperatures (below 160 °F) and store at 14 percent (or lower) moisture. Dry corn as gently as possible, even if it is tempting to crank it up for higher dryer capacity.

Also, use slow cooling methods after gas-fired drying to minimize quality problems. If possible, aerate stored grain to cool it to 20 to 30F for winter storage (in the upper Midwest).

Frost-damaged corn breaks easily and goes out of condition quickly, even at low moisture levels. Expect storage life to be about half as long as that of normal corn. Do not harvest through low-lying frost damaged areas. The mixture will be a high storage risk. Harvest and handle them separately.

Because immature corn kernels dry on the surface, expect the moisture level of stored corn to be higher than test results. Expect to aerate the stored corn frequently. Move immature corn to market before summer. Store only clean corn and pull out the fines-laden center core of grain in bins. ▀



Picture from Iowa State Extension

Animal feed is the best use for frost-damaged corn. Low test weight corn used for large animal feed is only slightly less valuable (2 to 5 percent).

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New York Farm Laborer Overtime Threshold to Decline

By Richard Stup, Cornell University. Originally published in the Ag Workforce Journal.

<https://agworkforce.cals.cornell.edu/2022/10/03/new-york-farm-laborer-overtime-threshold-to-decline/>

New York's state government took another major step toward reducing the farm laborer overtime threshold on September 30, 2022. Labor Commissioner Roberta Reardon issued a press release and official order accepting the findings of the Farm Laborer Wage Board report. The NY State Department of Labor will now begin a rule making process to make the Commissioner's order formally a state regulation, this process will include a 60-day public comment period. This is the conclusion of a long and controversial political process that started with the 2019 passage of the Farm Laborer's Fair Labor Practices Act (FLFLPA) in 2019, and continued through 14 lengthy public meetings and hearings of the wage board.

What changes will happen and when?

The overtime threshold for farm laborers is currently at 60 hours per week. This will not change for the rest of 2022 and for all of 2023. The overtime threshold will begin to decline on January 1, 2024 by dropping to 56 hours per week, and then it will continue to decline by four hours every other year after that until it reaches 40 hours per week in 2032. Here is the schedule:

- January 1, 2024, the threshold declines to 56 hours;
- January 1, 2026, the threshold declines to 52 hours;
- January 1, 2028, the threshold declines to 48 hours;
- January 1, 2030, the threshold declines to 44 hours;
- January 1, 2032, the threshold declines to 40 hours, and remains there.

Farm employers will be responsible for paying farm laborers 1.5 times their regularly hourly rate for any hours worked above the weekly overtime threshold. Note that overtime is only payable to those who meet the definition of "farm laborer." While this includes most farm employees, it does not include many family employees who are related to a farm owners, and some employees who are exempt from overtime due to their status as executive, professional, or administrative employees.

What about the tax credit for overtime?

With the 2022-23 Budget Act, New York state government created a new tax credit that will essentially cover the cost of overtime for farm employers. While this tax credit is technically effective now, it is not relevant because the required overtime threshold remains at 60 hours per week. Note, tax credits are only available for **state required** overtime, those employers who currently

pay overtime voluntarily below 60 hours per week are not eligible for the tax credit.

Here are a few details about the tax credit:

1. Farm employers who are corporations (including a New York S corporation), sole proprietorships, LLCs and partnerships are eligible.
2. Only "farm laborers" as defined in NY labor law are eligible employees. This makes sense because these are the only types of employees for whom overtime is required; family members and certain executives, professionals, and administrative personnel are excluded.
3. Eligible overtime hours include those in any calendar week that exceed the overtime threshold set by the commissioner of labor, up to 60 hours in a week. This is important, only those hours between the threshold and 60 hours are reimbursable through the tax credits, any overtime hours worked above 60 will not be reimbursed to the employer.
4. Only the overtime premium is reimbursable through the tax credit. For example, if the threshold is at 56 hours in 2024, and an employee whose regular pay is \$18/hour works 58 hours in one week that year, then she will be eligible for two hours of overtime pay. Overtime is 150% of regular pay so she will earn \$27 for each overtime hour worked. Only the overtime premium, the extra \$9/hour over her regular rate, is eligible for reimbursement through the tax credit.
5. When pay goes up, marginal costs such as taxes and worker's compensation premiums also go up. Recognizing this, the overtime tax credit will allow employers to take 118% of the eligible overtime compensation to cover those additional costs.
6. Advance payments of tax credits for overtime premiums paid from January 1st to July 31st are possible. To receive advance payments, employers will need to prepare their claim and submit it to the NYS Department of Agriculture and Markets.
7. NYS Ag and Markets will be involved in this process. They will develop an application process that employers will use to document their claim for the tax credit. Ag & Markets will then issue a certificate of tax credit to eligible employers.

One key point to note, just paying an employee via salary DOES NOT exempt them from overtime. They must qualify to be exempt from overtime based on their relationship to the owner or their job qualification.

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For more information about managing overtime and the implications of this new legislation, please contact Katelyn Walley-Stoll.

Obviously, there are many details to work out before January 1, 2024. Farm employers need to pay careful attention to their employee payroll record systems. It is important to have accurate and detailed records of employee hours worked and overtime paid in order to take advantage of this important and potentially large tax credit.

Where do we go from here?

New York farmers are intelligent, resilient, and adaptable, all of those qualities will be required in abundance for the years ahead. The best farm managers will continue to sharpen their leadership and employee management skills in order to recruit and retain the most effective and productive employees. New York farmers will adopt technologies and automation when it makes economic sense, and that automation will replace some farm labor, while it augments and increases the value of other skilled farm labor that remains.

The state tax credit will shift part of the cost of overtime to the people of New York, rather than causing farm employers to bear it alone. This shift will benefit farm employees who will likely work some overtime hours in New York, rather than face the serious reductions in work hours, and weekly income, that California and Washington farm employees are reportedly experiencing.

Going forward, as it has been in the past, the theme for farm employers will be to adapt and create something new, even in the face of adversity. ▪

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PRO-DAIRY &
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**One Day On-Farm Training
for Dairy Farms Feeders**
*Offered in English & Spanish at each site
featuring stations with mostly hands-on activities and demonstrations.*

Who Should Attend:

- ◆ Those who are currently feeding dairy cows and want to learn more about the how and why of what they're doing.
- ◆ Those who are interested in becoming a cow feeder and want to increase their knowledge of cow feeding.
- ◆ Anyone interested in learning more about how to improve the feeding process on their farm.

Topics Covered During Feeder School:

- ◆ Economics and Importance of feeder center analysis
- ◆ Dry Matter and Feeder Math-basics, how to measure, work it into ratio, refusals, adjust ration based on DM, feed software
- ◆ Feed Consistency-TMR audits
- ◆ Trouble Shooting Mixer Wagons
- ◆ Bunker Management, drone demonstration/map out bunk, bunk silo management, packing Density & Preservation
- ◆ Safety

Presenters: TBA

Registration: \$50.00 / per person.
[CLICK HERE TO REGISTER ONLINE](#) (SWNY)

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Dates and Locations:

Northern New York

Nov 1 | St. Lawrence County
Nov 2 | Jefferson County

Central New York

Nov 3 | Herkimer County / Montgomery Area

South Central New York

Nov 4 | Cortland County
Nov 8 | Cayuga County

South West New York

Nov 9 | Steuben County

Northwest New York

Nov 10 | Wyoming County
Nov 11 | Ontario County

Each region will offer separate registrations for their programs.

For more information contact your local Regional Ag Team or

Kathy Barrett, Cornell ProDairy at
607.229.4357 or kfb3@cornell.edu

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Join CCE and PRO-DAIRY for a Feeder School on November 9th. This hands-on, in-person program will bring Cornell and Industry experts to cover essential cow nutrition and ingredient management, on-farm sampling, and dry matter testing, among others. We will offer English & Spanish stations so we can accommodate everyone in one training! This training will have a \$50 fee/per person that will cover all materials for the training and lunch. **Scholarships are available for those who need them.** Register now in our website (<https://swnydlfc.cce.cornell.edu/>) or by contacting Camila Lage at (607-422-6788).

Utilizing the state tax credit to offset overtime increases will shift the cost of the new rule from the farm owner to the taxpayers of New York.

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We're so excited to host Feeder School (for the very first time!) in SWNY. Be sure to register and join us in Steuben County on November 9th.

Dairy Farming Essentials: Navel Care Beyond the Dip

By Camila Lage, Dairy Management Specialist

Disinfecting the navel cord is a common practice among farms and, for the most part, a pretty straightforward process. However, recent studies have shown that there is more to navel care than we realize. According to a study from Cornell University published in the *Journal of Dairy Science* (Wieland et al., 2017), umbilical infections may be more common than we diagnose on farms. While older studies indicate that 1.3% to 14% of calves develop an umbilical infection, these authors, using more advanced technology, diagnosed umbilical disorders in 27% of all calves enrolled in their study. Additional studies are being conducted to learn more about the implications this might have on calves and what else we can do to improve the diagnosis, reduce the incidence, and improve the treatment of umbilical infections. In the meantime, this article aims to review what we already know and how to fine-tune our management to guarantee an effective procedure for navel care.

What is the navel cord?

The navel, or umbilical cord, is the connection between the placenta of the dam and the fetus, passing through the calf's abdomen at the navel. It transports nutrients and oxygen to the fetus and carries waste products from the fetus to the dam to be excreted. The cord includes two arteries, a vein, and the urachus (channel between the bladder and the umbilicus) (Figure 1). At birth, the umbilical cord ruptures, and in a normal process, the structures retract into the abdomen, leaving the umbilical cord extending through the navel by 2 to 6 inches. If the cord doesn't get infected, it will dry up and shrink in the next 7 to 10 days.

Since the internal structures of the cord serve no purpose once the calf is born, they will also atrophy. However, before the cord is completely dried out, disease-causing pathogens from the environment can be wicked up the cord. In less severe cases, this causes an infection localized to the navel, but in more severe cases, the infection can travel further into the abdomen causing anything from liver infection to joint, respiratory, or systemic infections and death.

Why is navel cord care critical?

In a perfect world, all calves would have no problems with the umbilical cord shrinking after birth. The reality is that this doesn't happen 100% of the time. In some cases, the cord does not retract normally as a result of an excessively long or short external umbilical cord

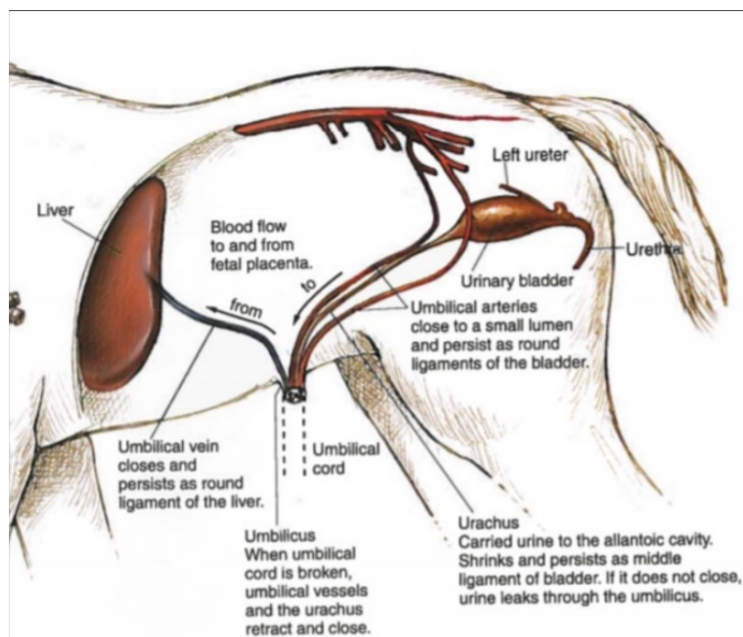


Figure 1. Diagram of internal nutrient and waste management structures attached to the umbilical cord in a young mammal.

<https://open.lib.umn.edu/largeanimalsurgery/chapter/umbilical-infections-and-patent-urachus/>

(due to genetics or traumatic events during calving) or a urachus that remains open and dribbling urine, which facilitates infection. We also see navels that do not close completely due to a navel hernia, which is usually linked to genetics as well.

In the study mentioned previously, (Wieland et al., 2017) the authors concluded that risk factors for navel infections include: calves born from cows that have given birth before, calves that are heavier at birth, and calves with a short umbilical cord at birth. They also found that calves developed an umbilical infection in over 50% of cases where the umbilical cord was short (ruptured at the attachment to the body wall). Calves with any of these conditions are more prone to infections, which means they need extra attention and care. Currently, no protocols for decreasing the number of calves with ruptured cords are available. One of the reasons for this is that we have low diagnosis and documentation of navel issues, limiting the development of solutions for the various problems we can encounter on our farms. We have come a long way on calf care, but moving forward, we still have a lot to figure out. As with most of the tasks on the farm, we need to do the basics very well, navel care included. In the section below,

A more recent study, using more advanced technology, diagnosed umbilical disorders in 27% of all calves.

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Be aware: Joint illness, respiratory issues, scours, sudden death can also indicate the presence of navel infection on the farm.

we will go over the most critical steps to prevent infections and the best practices when using a dip to disinfect the cord:

Preventing infections

- **Keeping it clean:** Clean and dry calving areas are the first step toward success in the navel care program since they will reduce the exposure of the "fresh" umbilical cord to bacteria. This is also true for the facility the calf is being taken to next. Calf bedding should be clean, dry, and abundant!
- **Minimizing the calf's time in the maternity pen:** Reducing the time the calf spends in the maternity pen after birth will likely reduce the calf's exposure to bacteria and reduce the chance of accidents, which include excessive licking or stepping on the umbilical cord.
- **Dipping the navel ASAP:** Disinfection of the umbilical cord is essential for three main reasons: to wash the dirt, kill bacteria and help dry up the cord (if using an alcohol-based product). The sooner you can do it the better since it will reduce the chance of colonization of the cord by bacteria. A tincture of iodine (7% or more) is the most used solution, but because of regulations on iodine sales and its reduced availability, other products are available with similar efficacies. Chlorhexidine 2% is the most used alternative and has the advantage of having high success in the presence of organic matter.

Best practices when using a dip to disinfect the cord:

- **Use gloves:** Navel care solutions usually have alcohol or other caustic ingredients that cause human skin irritation.
- **Dip the whole navel and avoid the skin around it:** Make sure you cover the entire navel cord (especially when calves have very long navels). Avoid intervention, like cutting the navel cord, if not extremely necessary. Also, avoid dipping the skin around the navel as we don't want to cause skin irritation in places that do not need to be disinfected. *Extra tip: Use a non-return dip or small disposable cup to ensure you don't contaminate your solution.*



Extra tip: Use a non-return dip or small disposable cup to ensure you don't contaminate your solution.

- **Keep the solution clean:** A dirty cup can reduce the efficacy of the disinfectant and spread bacteria. If utilizing a reusable non-return cup, make sure you dispose of the extra solution and wash the part that comes into contact with the calf after each use. If you use iodine, ensure you keep your solution in an amber flask since direct light can reduce its effectiveness.
- **Have impeccable colostrum management:** Part of disease prevention is maximizing the ability of the animal to fight infection. For newborn calves, it means early and adequate intake of high-quality colostrum since young calves lack disease protection because antibodies do not pass across the cow's placenta to the fetus' circulatory system.
- **Re-dip the navel:** Although one application of the navel solution may be enough when calves are born in clean environments, some navel cords need extra help to dry without issues. Disinfecting the navel a second time within the first day of life and daily after that for two additional days may help to improve your navel care management.
- **You can not manage what you don't measure:** Navel infections are often not diagnosed in calves since it is hard to identify them visually. You need to palpate the navel cord to confirm. To track whether your navel care program is working, calves should be checked 2 or 3 times during the first week of age (until the cord is healed). The cord should not be any bigger than your thumb. It should also be soft and not cause discomfort when squeezed. The goal is to have less than 1% of the calves on your farm develop navel infections. A helpful tool is the Calf Health Score Charts developed by the University of Wisconsin – Madison to score the navel (see chart below).
- **Work with your Veterinarian to create a treatment protocol for navel infections:** Early identification and correct treatment can reduce the mortality of animals with navel infections. ▀

Navel Score	
0	Normal (thumb rule)
1	Slightly enlarged, not warm or painful
2	Slightly enlarged, with slight pain, heat or moisture
3	Enlarged with pain, heat, or malodorous discharge

Source: Based on UW health score chart (<https://www.vetmed.wisc.edu/fapm/wp-content/uploads/2020/01/CalfHealthScoringChart-2018-EN-std.pdf>)

If you have any questions, reach out to Camila Lage (607-422-6788) You can find an illustrated summary of this article on the next page. Check it out!



This information is for educational and reference purposes and is not a substitute for sound veterinarian consultation and following product labels. Cornell Cooperative Extension is dedicated to providing research-based information to our agricultural producers. Every effort has been made to provide correct, complete, and up-to-date recommendations.



Navel Care for Dairy Calves

Cornell Cooperative Extension

Southwest NY Dairy, Livestock and Field Crops Program

Why is navel care important?

The navel or umbilical cord is the connection between the placenta of the dam and the fetus and nourishes the calf before they are born. At birth, the umbilical cord ruptures, leaving the umbilical cord extending through the navel. If the cord doesn't get infected, it will dry up and shrink in the next 7 to 10 days. However, before the cord is completely dried out, disease-causing pathogens from the environment can be wicked up the cord and it is our job to help the calf win this battle.

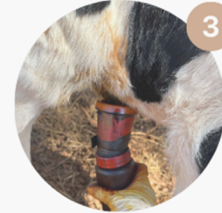
How can we help?



1. Clean and dry calving areas are the first step



2. Minimizing the calf's time in the maternity pen



3. Disinfect the umbilical cord ASAP

Photo: Rafael Azevedo

Photo: Geovanna Branquinho

Signs of navel problems at farms includes:



Navel ill



Joint ill

Sudden death with respiratory symptoms and/or scours



Best practices when using a dip to disinfect the umbilical cord:

1. Use gloves

Navel care solutions usually have alcohol or other caustic ingredients that cause skin irritation.



2. Dip the whole cord

Avoid the skin around it to reduce skin irritation); Avoid cutting the navel cord, if not extremely necessary; Extra tip: use a no-return dip to ensure you don't contaminate your solution.

3. Keep the solution clean:

Dirt and excessive light can reduce the efficacy of the disinfectant (specially iodine) and spread bacteria; Use an amber flask and make sure you dispose the extra solution and wash the part that comes into contact with the calf after finishing using the flask.



Photo: Rafael Azevedo

4. Have impeccable colostrum management:

Early and adequate intake of high-quality colostrum is very important to protect calves against any infections.

5. Re-dip the navel:

One application may be enough when calves are born in clean environments but disinfecting the navel a second time within the first day of life and daily after that for two additional days can help step up your navel care protocol and reduce issues.



Measuring to Manage!

Palpate the navel 2 or 3 times during the first week of age; The general rule is that the cord should not be any bigger than your thumb should also be soft and not cause discomfort when squeezed.

If more than 1% of calves are having navel issues or you are observing calves with joint issues and/or sudden death in the first days of life, talk to your Veterinarian.



"MEAT" YOUR FARMER

An event for livestock farmers and the community to meet and learn about on-farm meat sales and purchasing options

JOIN US FOR TWO NOVEMBER EVENTS

📍 CORNELL COOPERATIVE EXTENSION OF CATTARAUGUS COUNTY
28 PARKSIDE DRIVE, ELLICOTTVILLE, NY 14731
🕒 SATURDAY, NOVEMBER 5TH, 1-3PM

📍 FLUVANNA VOLUNTEER FIRE DEPARTMENT
3536 FLUVANNA AVE, JAMESTOWN, NY 14701
🕒 WEDNESDAY, NOVEMBER 9TH, 6-8PM

EVENT FEATURES:

- POP-UP FARMERS MARKET FEATURING LOCAL LIVESTOCK FARMERS OFFERING CUTS AND BULK ORDERING OF BEEF, PORK, LAMB, GOAT, AND CHICKEN FOR SALE
- TASTING OF LOCALLY PRODUCED MEATS PREPARED IN EXCITING NEW WAYS
- EDUCATIONAL PROGRAM ON HOW TO BUY MEAT DIRECTLY FROM YOUR LOCAL FARMER WITH GUEST SPEAKERS FROM SHINING STAR CATTLE COMPANY AND CORNELL COOPERATIVE EXTENSION
- RAFFLE FOR GIFT CERTIFICATES TO LOCAL MEAT FARMS

NEED-TO-KNOWS:

- FREE ADMISSION
- NO RSVP REQUIRED, BUT APPRECIATED (SEE CONTACT INFO BELOW)
- NO PURCHASE NECESSARY TO PARTICIPATE IN THE RAFFLE
- ONE RAFFLE TICKET PER ADMISSION. ADDITIONAL RAFFLE TICKETS AVAILABLE FOR PURCHASE. MUST BE PRESENT TO WIN!

QUESTIONS?

For the Jamestown event, contact Lisa Kempisty at lj4@cornell.edu or (716) 664-9502 ext 203
For the Ellicottville event, contact Amy Barkley at amb544@cornell.edu or (716) 640-0844

A BIG THANK YOU GOES OUT TO OUR EVENT SPONSORS!



Would you like copies of this flyer to hand out to your customers or share on social media? Contact Amy for more information!

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A similar event hosted by CCE Chautauqua in 2019 introduced 90 community members to 30 farmers.

ARE YOU INTERESTED IN BEING A PARTICIPATING FARM?

You can register for one or both of our events!

OUR GOALS FOR THESE EVENTS:

Provide a platform to educate the public on bulk meat sales and buying directly from the farm.

Increase awareness for the utilization of less popular meat cuts.

Excite the public to connect with their local farming community.

PARTICIPATION DETAILS:

- You will be provided a 10' x 10' space to set up a booth for your farm. Banners, price sheets, bulk meat order forms, and coolers of product to sell the night of the event are encouraged.
- **Booth fee:**
 - Option A: \$50 in gift certificates (provided as two \$25 gift certificates) to your farm, which will be raffled off to program attendees.
 - Option B: Meat donation for the tasting

MEAT DONATION FOR THE TASTING:

As part of this event, we are looking to provide the community with a tasting of dishes featuring locally raised meats. Our goal is to utilize the less popular cuts to show that they're just as good as the popular ones! Recipe cards from the events' tastings will be provided to the community using these underutilized cuts so that people can make the same dishes at home.

Participating farms can choose to pay their booth fee with meat, which our caterer partner will prepare into appetizer-sized portions. The caterer will prepare 100 portions per event. If you choose to donate meat, we will place a chafing dish containing your product at your booth to directly connect the public with the farmer who produced the meat.




We are looking for the following:

Beef (2 farms)
Pork (2 farms)
Lamb (1 farm)
Goat (1 farm)
Chicken (1 farm)

 **CORNELL COOPERATIVE EXTENSION OF CATTARAUGUS COUNTY**
28 PARKSIDE DRIVE, ELLICOTTVILLE, NY 14731
 **SATURDAY, NOVEMBER 5TH, 1-3PM**
 **CONTACT: AMY BARKLEY AT AMB544@CORNELL.EDU OR (716) 640-0844**

For questions, comments, and/or to register, contact Lisa Kempisty or Amy Barkley

Farmers who are interested in participating must register on the bulk meat sales platform, www.meatsuite.com

 **FLUVANNA VOLUNTEER FIRE DEPARTMENT**
3536 FLUVANNA AVE, JAMESTOWN, NY 14701
 **WEDNESDAY, NOVEMBER 9TH, 6-8PM**
 **CONTACT: LISA KEMPISTY AT LJK4@CORNELL.EDU OR (716) 664-9502 EXT 203**

Do you have multiple livestock species on the farm? Feel free to bring a little bit of everything to this pop-up farmer's market!

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For more information about this event, contact Amy Barkley at 716-640-0844 or amb544@cornell.edu



RAISING AND MANAGING COWS FOR AUTOMATED MILKING SYSTEMS

Please join MSU Extension and the Cornell Cooperative Extension SWNY Dairy Team for our talk with Dr. Joao Costa and Dr. Trevor DeVries on raising and managing cows for automated milking systems .



Webinar Live



November 16, 2022



12:00 - 1:30 PM (ET)



Joao Costa

Assistant professor
University of Kentucky



Trevor DeVries

Professor and Canada
Research Chair
University of Guelph



Register here:

www.events.anr.msu.edu/cowsAMS



Cornell Cooperative Extension

Southwest NY Dairy, Livestock and Field Crops Program

MICHIGAN STATE UNIVERSITY | Extension

Advancements in technology in the past years made AMS a reliable machine that can successfully harvest milk. However, as with any other system, management is key to guaranteeing productivity and efficiency.

In AMS, cow behavior is a big piece of the puzzle. Researchers have been studying how early life nutrition, environment, and human-animal interaction can affect cow behavior and how cows with different personalities perform in AMS.

We are pleased to invite you to our next webinar: "Raising and Managing Cows for Automated Milking Systems." The webinar will take place on Wednesday,

November 16th, at noon (Eastern time). In this edition, Dr. Joao Costa, Professor at the University of Kentucky, and Dr. Trevor DeVries, Professor at the University of Guelph and Canada Research chair, will join us to talk about raising and Managing cows for Automated Milking Systems.

If you have any questions about this topic that you want answered during the webinar, please connect with Camila Lage to submit your questions.

If you have any questions about the webinar, accommodations, or other inquiries, please email rochamal@msu.edu or cd546@cornell.edu.

Join us on November 16th at Noon to hear from Dr. Joao Costa and Dr. Trevor DeVries on Raising and Managing Cows for Automated Milking Systems.

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If you have any questions about the webinar, accommodations, or other inquiries, please email cd546@cornell.edu.

Dairy Market Watch



September 2022

Prepared by Katelyn Walley-Stoll. Funded by PRO-DAIRY.

An educational newsletter to keep producers informed of changing market factors affecting the dairy industry.

Milk Component Prices			Milk Class Prices				Statistical Uniform Price & PPD				
Month	Butterfat	Protein	I (Boston)	II	III	IV	Jamestown, NY		Albany, NY		Albany \$/gal. to farmer
Aug 21	\$1.85	\$2.45	\$20.15	\$16.51	\$15.95	\$15.92	\$16.54	\$0.59	\$17.14	\$1.19	\$1.48
Sep 21	\$1.93	\$2.60	\$19.84	\$16.89	\$16.53	\$16.36	\$16.81	\$0.28	\$17.41	\$0.88	\$1.50
Oct 21	\$1.94	\$3.01	\$20.33	\$17.08	\$17.83	\$17.04	\$17.29	(\$0.54)	\$17.89	\$0.06	\$1.54
Nov 21	\$2.15	\$2.75	\$21.23	\$18.40	\$18.03	\$18.79	\$18.39	\$0.36	\$18.99	\$0.96	\$1.64
Dec 21	\$2.29	\$2.59	\$22.42	\$19.84	\$18.36	\$19.88	\$19.34	\$0.98	\$19.94	\$1.58	\$1.74
Jan 22	\$2.95	\$2.35	\$22.96	\$22.83	\$20.38	\$23.09	\$21.59	\$1.21	\$22.19	\$1.81	\$1.91
Feb 22	\$3.02	\$2.31	\$24.89	\$23.79	\$20.91	\$24.00	\$22.52	\$1.61	\$23.12	\$2.21	\$1.99
Mar 22	\$3.09	\$2.71	\$26.13	\$24.76	\$22.45	\$24.82	\$23.59	\$1.14	\$24.19	\$1.74	\$2.09
Apr 22	\$3.41	\$3.42	\$27.63	\$25.71	\$24.42	\$25.31	\$24.92	\$0.50	\$25.52	\$1.10	\$2.20
May 22	\$3.10	\$3.86	\$28.70	\$25.87	\$25.21	\$24.99	\$25.42	\$0.22	\$26.03	\$0.82	\$2.24
June 22	\$3.33	\$3.41	\$29.12	\$26.65	\$24.33	\$25.83	\$25.83	\$1.50	\$26.43	\$2.10	\$2.28
July 22	\$3.36	\$2.91	\$29.12	\$26.66	\$22.52	\$25.79	\$25.21	\$2.69	\$25.81	\$3.29	\$2.23
Aug 22	\$3.40	\$2.14	\$28.38	\$26.91	\$20.10	\$24.81	\$24.27	\$4.17	\$24.87	\$4.77	\$2.14

August Utilization (Northeast): Class I = 28.7%; Class II = 25.5%; Class III = 30.1%; Class IV = 15.7%.
Class I = fluid milk; Class II = soft products, cream, and yogurt; Class III = cheese (American, Italian), evaporated and condensed products; Class IV = butter and milk powder.

Dairy Commodity Markets (Excerpt from USDA Dairy Market News – Volume 89, Report 38, September 23rd, 2022)

Dry Products: Throughout all regions prices for low/medium heat nonfat dry milk (NDM) moved higher in most or all facets. Contacts in the West report increased international demand as exports to Mexico are trending higher. High heat NDM prices moved higher in the Central and East, amid limited trading. In the Northeast, demand for dry whey is steady and drying operations are running steady production schedules.

Cheese: Milk availability is tightening across all regions, though cheese makers in the Northeast and West say volumes are sufficient for steady production. In the Northeast and West, strong demand for cheese is present from export purchasers. Domestic sales are declining in the Northeast. In the Northeast, spot purchasers say cheese is available.

Butter: In the West, cream volumes are tight though sales are mixed. Regional ice cream makers are reducing their purchasing, but demand for cream is strong from butter makers. High cream multiples in the Northeast are causing some butter makers to steer cream away from churns, reducing butter production. In the Northeast, retail butter demand is picking up, but tight inventories are causing some producers to regulate supplies across existing orders.

Fluid Milk: Milk production is flat in much of the country, though in some parts of the West output is declining. Furthermore, cooler weather in the Midwest and California is contributing to increased cow comfort and milk output. Demand for fluid is mostly flat in the East, as milk going into educational pipelines has leveled out. Condensed skim volumes are tight in the Northeast and West, and contacts in the West report strong spot demand. Cream availability is limited in all regions. In the East and West, contacts say increased volumes of cream are being utilized by cream cheese processors.

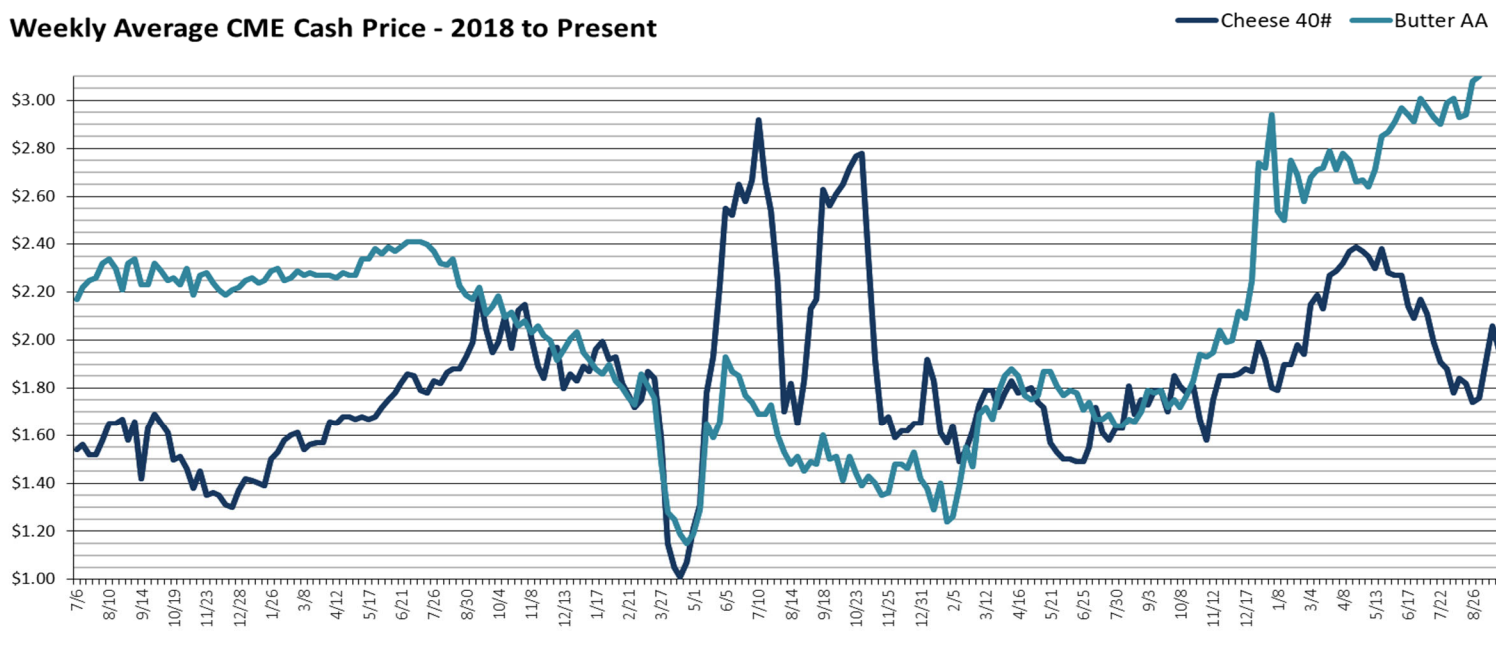
Friday CME Cash Prices					
Dates	8/26	9/2	9/9	9/16	9/23
Butter	\$3.08	\$3.10	\$3.17	\$3.13	\$3.13
Cheese (40# Blocks)	\$1.74	\$1.76	\$1.91	\$2.06	\$1.96

August's Albany \$/Gallon was \$2.14, 9 cents lower than July's. This reflects a continued slow decline of milk prices.



For more information on Dairy Business Management and Market Analysis, contact Katelyn Walley-Stoll, Farm Business Management Specialist, at 716-640-0522 or kaw249@cornell.edu.

Weekly Average CME Cash Price - 2018 to Present



Comparing PPDs - The Market Administrator's Bulletin, Federal Order No. 1, August 2022

By Shawn Boockoff, Market Administrator, Originally published here: https://www.fmmone.com/MA_Bulletin/Monthly/bull202208.pdf

The Producer Price Differential (PPD) for August 2022 for the Northeast Order set a record high at \$5.32 per hundredweight (cwt) at the base location of Boston, MA. The PPD is one portion of the total revenue paid to dairy farmers marketing milk in a federal order that pay producers based on milk components. It represents the difference between the market-wide pool revenue, or the pool classified value, and the amount paid out to producers for their milk's component value (butterfat, protein, and other solids) at the standardized level.

The pool classified value is determined by the amount of milk utilized in each class, along with the price level for each class. Producers are paid for their components from this pool classified value. Components are paid at the Class III level for butterfat, protein, and other solids. Any value that still exists in the total pool classified value is then paid out to producers based on their volume shipped to regulated handlers. This extra value, if there is any, is shown as the PPD. It can have extremely varied levels of contribution to the overall SUP. Added value occurs when producer milk is used in classes other than Class III that have prices above the Class III price.

For the month of August 2022, the difference between the classes other than Class III ranged from \$4.71 to \$8.28 per cwt. With nearly 70 percent of the total pool volume priced at the higher valued classes and those classes having significantly higher prices than Class III in August, a larger than usual amount of money was generated

that was then distributed to producers resulting in the \$5.32 PPD. Each producer would receive this PPD adjusted to the location of the plant where their milk was delivered.

A high, or large PPD is not necessarily an indicator of better prices. The second highest ever PPD since the Northeast Order's inception occurred in November 2000 at \$4.79 per cwt. For that same month, the SUP was only \$13.36 at Boston; Class I was \$15.07; Class II \$13.68; Class III \$8.57; and Class IV \$13.00 per cwt. During November 2000, Class III usage was 28.4 percent (compared to 30.1 in August 2022), while the other three classes combined for 71.6 percent of the total pool (compared to 69.9 in August 2022).

Another point worth making is that a high SUP may occur in times of low or negative PPD's. For example, April 2014 reported a SUP of \$25.46, slightly higher than the most recent SUP, but the PPD for that month was only \$1.15 per cwt. July 2020 reported the lowest PPD, a negative \$5.46, but a SUP of \$19.08, lower than current prices, but well above the November 2000 price when the PPD was \$4.79 per cwt. This shows that a negative PPD does not necessarily result in diminished producer revenue. The negative PPD results when the total value of producer components exceeds the pool's classified value – when the Class III price is the highest of the class prices. The calculation of the PPD can be thought of as an accounting method to “balance the books” of the monthly federal order pool. ■

July 2020 reported the lowest PPD, a negative \$5.46, but a SUP of \$19.08, lower than current prices, but well above the November 2000 price when the PPD was \$4.79 per cwt.

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This shows that a negative PPD does not necessarily result in diminished producer revenue. Calculating based on PPD could be considered “Balancing the Books”.

Did the Breeding Take? Pregnancy Verification Options for your Momma Cows

by Amy Barkley, Livestock and Beginning Farm Specialist

Breeding is an important time of year for beef producers in that its success will determine the number of calves on the ground the following season. Many beef enterprises run on thin margins, and a cow that's not producing a calf is not pulling her weight.

To put this into perspective, a 1,200 pound cow eats about 36 pounds of dry matter per day. If you are grazing for 180 days a year, that means you're feeding her 6,660 pounds of dry matter (7,250 pounds of dry hay or 9,500 - 11,000 pounds of baleage) a year! With the cost of forage ever climbing, plus the added costs including supplements, vaccines, and breeding costs, an animal that is a chronic non-breeder is hurting the enterprise. Therefore, it's a good idea to check your animals to make sure they're pregnant and make culling decisions early.

Checking for pregnancy in beef cattle via blood tests and ultrasound can be done about 30 days after conception, whether that be following AI or a confirmed breeding by a bull. However, keep in mind that confirmations via palpation require the cow to be closer to 45 days along at minimum. If the herd is AI only, you can begin to check for pregnancy at 30-60 days. If you're using a bull, count 30-45 days from the time you take the bull out. That way, you won't encounter as many false negatives.

As mentioned above, there are three methods of checking for pregnancy that are commonly used in beef herds. Using the details below can help you determine which is right for you.

Rectal Palpation

This method of checking relies on feeling the physiological changes that happen to the cow's ovaries and uterine horns once a pregnancy has been established. This should only be done by someone skilled in picking up those differences to have the greatest accuracy. For many, this procedure is completed by the herd's veterinarian. The person doing the inspection will use a gloved arm to reach into the rectum and feel the reproductive structures through the rectal wall. An accurate diagnosis is most often achieved between 45 - 120 days following breeding.

Ultrasound

Ultrasound requires the use of an ultrasound machine and knowledgeable operator to determine pregnancy. This technique is performed by many veterinarians or herdspeople who regularly ultrasound their

animals and can justify the machine's purchase. Using it requires the understanding of anatomy and how to adjust the settings on the device to be able to see through the tissues of cows with varying levels of finish and/or body type. That said, it can be easily learned and does not require the repetitive training needed to be proficient at rectal palpation.

For beginners, finding whether there is a calf in the uterus is relatively easy. Those more experienced persons can determine fetal viability, fetal sex identification, and presence of developmental abnormalities. An accurate identification of pregnancy can take place around 30 days, whereas the fetus's characteristics can be detected closer to 60 days.

Blood Test

There are many commercially available blood test kits on the market, but they all work the same way. Blood is drawn into provided tubes and sent to a lab, where the presence or absence of pregnancy-associated glycoproteins and/or progesterone concentrations is determined. The kits are easily accessible and have specific instructions for how to draw, handle, and ship the blood. The tests only work if they are used around 30 days of pregnancy, but this may vary slightly by the kit used.

All three of the methods to check pregnancy listed above require you to be able to restrain the cattle such that they can be worked with in a safe manner. This includes headgates for calmer cattle and chute systems for cattle that aren't as easily worked. Chute systems are the safest option in any case, as they limit the cows' movement the best, which greatly reduces the chances of injury to their handlers.

Once the pregnancy results are in, check how many cows took. Ask yourself why the ones that didn't take didn't. From there, you can make the decision as to whether you'd like to try and rebreed or if you want to cull the cow. External factors such as very hot weather during breeding time or not having time to get condition back on the cow before breeding are two common reasons for cows turning up open and may not be good reasons to cull. Cows that are older or generally have a difficult time breeding are more likely candidates to leave your program.

Work with your herd veterinarian verification method will work the best for your farm and your breeding protocols.



Accurate and timely pregnancy verification allows you to make rebreeding and culling decisions that will help positively affect your bottom line.



High-Moisture Corn

Excerpt from Dupont and Pioneer Silage Zone Manual

The term “high moisture corn” (HMC) can technically be applied to any corn harvested above traditional combining moistures and then allowed to ferment in the store structure. It can range from as low as 22-24% kernel moisture recommended in sealed, upright storage structures to as high as 30-36% kernel moisture for bunker stored snaplage.

High-moisture corn can be harvested with a combine (high-moisture shelled corn), with a corn picker or a combine with some of the cob retained (high-moisture ear corn or earlage) or as snaplage (ear and husk harvested with a forage chopper retrofitted with a snapper corn head). There has been increased interest in snaplage due to the cost savings compared to harvesting with a combine and having to process kernels (e.g. tub-grind) at the storage structure. Recent studies have also confirmed that if harvested at the proper kernel moisture, snaplage can have extremely high feeding value if processed and stored correctly.

To capture the most starch per acre, high-moisture corn harvest should not begin until the kernels have reached black layer and are physiologically mature. For most hybrids, kernels will be between 34-36% moisture at black layer. ▀

High-Moisture Corn (HMC) can be useful in your crop system depending on your feed-out needs. However, it’s important to have proper storage and harvest timing.

ESTIMATING CORN GRAIN YIELDS

This procedure is based on information used in developing the “Corn Yield Calculator” rule published by the University of Illinois:

1. Count number of ears in 1/1000 acre.
2. Select 3 representative ears and count the number of rows or kernels and the number of kernels per row for each. Do not count tip kernels that are less than half the size.
3. Estimate the yield for EACH of the 3 ears as follows: (Number of ears in 1/1000 A) x (number of kernel rows) x (number of kernels per row) x 0.01116 = bushels per acre at 15.5% moisture.
4. Average the yield estimates from the 3 ears. Repeat steps 1-4 at several sites and average the results to estimate grain yield for the entire field.

ROW WIDTH (inches)	LENGTH EQUAL TO 1/1000 A
15"	34' 10"
20"	26' 1"
28"	18' 8"
30"	17' 5"
36"	14' 6"
40"	13' 1"

ADVANTAGES of HMC
Earlier harvest that fits well between corn silage and dry grain.
Increased yields of 9-12% per acre if also harvesting the cob.
Potential cost savings compared to harvesting dry corn and processing at the storage structure.
Higher ruminal starch availability compared to dry corn.
Additional source of digestible fiber if cobs and husk are harvested in a timely manner.

DISADVANTAGES of HMC
Fermentation and feedout losses.
Potential for the corn crop to get overly dry reducing digestibility and palatability.
Higher inventory carrying cost.
More inconsistent than dry grain because of changing starch digestibility over time in storage. If the corn crop gets too dry (<25%), problems start to mount in terms of reduced cob digestibility in earlage and snaplage, fermentation issues and potential instability in the feed bunk.



Calculate your corn grain yield by utilizing the formula above. For more information or assistance, contact Katelyn Miller.

Cornell Professional Sheep Shearing School to be held November 11 - 12, 2022 in Ithaca

What each student will learn:

How to shear a sheep effectively in a pattern • Proper handling of shearing equipment • Sheep handling • Physical fitness

This school is focused on shearers with **prior** experience that are looking to make shearing a profession or looking to improve their ability to shear their own large flocks. Shearing equipment will **NOT** be provided for use during the school. It is recommended that you have a minimum of 3 medium-beveled combs and 9 cutters (3 cutters per comb). If you need gear or have questions about shearing equipment, call Doug at 320-583-7281.

The class will be limited to 12 students. Applications can be requested by contacting Amy Barkley at 716-640-0844. Applicants are requested to submit their applications by October 21st. Contact Jess Waltmyer (Cornell Sheep Farm Manager) with any additional questions at (724) 504-3567 or jrk272@cornell.edu.



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**CROPS
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CRITTERS**
newsletter

Currently, we're building our agribusiness directory to include Veterinarians and their practices, lime and fertilizer suppliers, feed mills, and tax preparers/accountants.

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